PROPOSED ACTION:	Issuance of an Incidental Harassment Authorization to SAExploration, Inc., for the Take of Sea Otters Incidental to a 3D Seismic Survey in Cook Inlet, Alaska.
TYPE OF STATEMENT:	Environmental Assessment
LEAD AGENCY:	U.S. Department of Interior U.S. Fish and Wildlife Service
RESPONSIBLE OFFICIAL:	Geoffrey L. Haskett, Regional Director Alaska Region U.S. Fish and Wildlife Service
FOR FURTHER INFORMATION:	Deborah Pierce Williams U.S. Fish and Wildlife Service Alaska Region Marine Mammals Management 1011 East Tudor Road, MS 341 Anchorage, Alaska 99503 907-786-3800
LOCATION:	Cook Inlet, Alaska.
ABSTRACT:	This Environmental Assessment analyzes the environmental impacts of the U.S. Fish and Wildlife Service, Alaska Region proposal to issue an Incidental Harassment Authorization, pursuant to section 101(a)(5)(D) of the Marine Mammal Protection Act, to SAExploration, Inc., for the take of small numbers of northern sea otters incidental to conducting a 3D seismic survey in Cook Inlet, Alaska.
DATE:	July 2014

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LIST OF ACRONYMS AND ABBREVIATIONS

3D	three dimensional
ADF&G	Alaska Department of Fish and Game
ADCCE	Alaska Department of Commerce, Community, and Economic
ADNR	Alaska Department of Natural Resources
AKRO	Alaska Regional Office
ANO	Alaska Native Organization
Authorization	Incidental Harassment Authorization
BOEM	Bureau of Ocean Energy Management
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CIMMC	Cook Inlet Marine Mammal Council
cui	cubic inches
dB re 1 µPa	decibel referenced to one microPascal
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
EZ	Exclusion Zone
FONSI	Finding of No Significant Impact
ft	feet
FR	Federal Register
Hz	Hertz
km	kilometer
km^2	square kilometer
m	meter
mi	miles
mi^2	square miles
m^3/sec	cubic meters per second
MHHW	Mean Higher High Water
MMPA	Marine Mammal Protection Act
NEPA	National Environmental Policy Act
PAM	Passive Acoustic Monitoring
PRD	Protected Resources Division
PSO	Protected Species Observer
rms	root-mean-squared
SAE	SAExploration, Inc.

Chapter 1 Introduction and Purpose and Need

1.1. Description of Proposed Action

The Marine Mammal Protection Act (MMPA) prohibits the incidental taking of marine mammals, including northern sea otters (*Enhydra lutris kenyoni*). The incidental take of a marine mammal falls under three categories: mortality, serious injury, or harassment, which includes injury and behavioral effects. The MMPA defines harassment as any act of pursuit, torment, or annoyance which: (1) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (2) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment). There are exceptions to the MMPA's prohibition on take such as the authority at issue here for us to authorize the incidental taking of small numbers of marine mammals by harassment upon the request of a U.S. citizen provided we follow certain statutory and regulatory procedures and make determinations. We describe this exception set forth in the MMPA at Section 101(a)(5)(D) in more detail in Section 1.2.

We propose to issue an Incidental Harassment Authorization (Authorization) to SAExploration, Inc. (SAE) under the MMPA for the incidental taking of small numbers of marine mammals, incidental to the conduct of a three dimensional (3D) seismic survey program in Cook Inlet, Alaska. We do not have the authority to permit, authorize, or prohibit SAE's seismic survey activities under Section 101(a)(5)(D) of the MMPA, as that authority lies with a different Federal agency.

Our proposed action is a direct outcome of SAE requesting an authorization under Section 101(a)(5)(D) of the MMPA to take marine mammals, by harassment, incidental to conducting a 3D seismic survey because these activities have the potential to take marine mammals by exposing them to noise originating from the seismic airgun arrays used for seismic data acquisition. We anticipate that the acoustic stimuli associated with these activities would result in take otherwise prohibited by the MMPA. SAE therefore requires an Authorization for incidental take and has requested that we provide it through the issuance of an Incidental Harassment Authorization under section 101(a)(5)(D) of the MMPA.

Our issuance of an Authorization to SAE is considered a major federal action under the National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ) regulations in 40 CFR §§ 1500-1508. Thus, we are required to analyze the effects on the human environment and determine whether they are significant such that preparation of an Environmental Impact Statement (EIS) is necessary.

This Environmental Assessment (EA), titled "*Issuance of an Incidental Harassment Authorization to SAE Alaska Corporation for the Take of Marine Mammals Incidental to a 3D Seismic Survey in Cook Inlet, Alaska*," (hereinafter, SAE EA) addresses the potential

environmental impacts of two alternatives available to us under section 101(a)(5)(D) of the MMPA, namely:

- Issue the Authorization to SAE for Level B harassment take of sea otters under the MMPA during their 3D seismic survey program, taking into account the prescribed means of take, mitigation measures, and monitoring requirements required in the proposed Authorization; or
- Not issue an Authorization to SAE in which case, for the purposes of NEPA analysis only, we assume that the activities would proceed and cause incidental take without the mitigation and monitoring measures prescribed in the proposed Authorization.

1.1.1. Background on SAE's MMPA Application

SAE proposes to conduct a 3D seismic survey in Cook Inlet, Alaska. The activity would occur for approximately 4 months between August 15 and December 15, 2014. Seismic surveys are designed to collect bathymetric and sub-seafloor data that allow the evaluation of potential shallow faults, gas zones, and archeological features at prospective exploration drilling locations. This is the first section 101(a)(5)(D) MMPA Authorization request from SAE for takes of marine mammals incidental to seismic surveying in Cook Inlet. Acoustic stimuli generated by the seismic airgun array have the potential cause behavioral disturbances to marine mammals in the proposed project area.

1.1.2. Marine Mammals in the Action Area

The proposed seismic survey program could adversely affect northern sea otters, the one marine mammal species occurring in the Action Area that is under our jurisdiction.

1.2. Purpose and Need

The MMPA prohibits "takes" of marine mammals, with a number of specific exceptions. The applicable exception in this case is an authorization for incidental take of marine mammals in section 101(a)(5)(D) of the MMPA.

Section 101(a)(5)(D) of the MMPA directs the Secretary of Interior (Secretary) to authorize, upon request, the incidental, but not intentional, taking of small numbers of marine mammals of a species or population stock, by United States citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if we make certain findings and provide a notice of a proposed authorization to the public for review. Entities seeking to obtain authorization for the incidental take of marine mammals under our jurisdiction must submit such a request (in the form of an application) to us.

Purpose: The primary purpose of our proposed action—the issuance of an Authorization to SAE—is to authorize (pursuant to the MMPA) the take of marine mammals incidental to SAE's proposed activities. The Authorization, if issued, would exempt SAE from the take prohibitions contained in the MMPA.

To authorize the take of small numbers of marine mammals in accordance with Section 101(a)(5)(D) of the MMPA, we must evaluate the best available scientific information to determine whether the take would have a negligible impact on marine mammals or stocks and not have an unmitigable impact on the availability of affected marine mammal species for certain subsistence uses. We cannot issue an Authorization if it would result in more than a negligible impact on marine mammal species or stocks or if it would result in an unmitigable impact on subsistence.

In addition, we must prescribe, where applicable, the permissible methods of taking and other means of effecting the least practicable impact on the species or stocks of marine mammals and their habitat (i.e., mitigation), paying particular attention to pupping areas and other areas of similar significance. If appropriate, we must prescribe means of effecting the least practicable impact on the availability of the species or stocks of marine mammals for subsistence uses. Authorizations must also include requirements or conditions pertaining to the monitoring and reporting of such taking in large part to better understand the effects of such taking on the species. Also, we must publish a notice of a proposed Authorization in the *Federal Register* for public notice and comment.

The purpose of this EA is therefore to determine whether the take authorized by our issuing the requested IHA, and resulting from SAE's seismic survey activities, would have a negligible impact on affected marine mammal species or stocks, would not have an unmitigable adverse impact on the availability of marine mammals for taking for subsistence uses, and develop mitigation and monitoring measures to reduce the potential impacts.

Need: On April 1, 2014, the Service determined that SAE had submitted an adequate and complete application demonstrating both the need and potential eligibility for issuance of an Authorization in connection with the activities described in section 1.1.1. We now have a corresponding duty to determine whether and how we can authorize take by Level B harassment incidental to the activities described in SAE's application. Our responsibilities under section 101(a)(5)(D) of the MMPA and its implementing regulations establish and frame the need for this proposed action.

Any alternatives considered under NEPA must meet the agency's statutory and regulatory requirements. Our described purpose and need guide us in developing reasonable alternatives for consideration, including alternative means of mitigating potential adverse effects. Thus, we are developing and analyzing alternative means of developing and issuing an Authorization, which may require the applicant to include additional mitigation and monitoring measures in order for us to make our determinations under the MMPA.

1.3. The Environmental Review Process

NEPA compliance is necessary for all "major" federal actions with the potential to significantly affect the quality of the human environment. Major federal actions include activities fully or

partially funded, regulated, conducted, authorized, or approved by a federal agency. Because our issuance of an Authorization would allow for the taking of sea otters consistent with provisions under the MMPA and incidental to the applicant's activities, we consider this as a major federal action subject to NEPA.

We prepared this EA to determine whether the direct, indirect, and cumulative impacts related to the issuance of an Authorization for incidental take of sea otters under the MMPA during the conduct of SAE's seismic survey program in Cook Inlet, Alaska, could be significant. If we deem the potential impacts to be not significant, this analysis, in combination with other analyses incorporated by reference, may support the issuance of a Finding of No Significant Impact (FONSI) for the proposed Authorization.

1.3.1. Laws, Regulations, or Other NEPA Analyses Influencing the EA's Scope

We have based the scope of the proposed action and nature of the two alternatives (i.e., issue the Authorization including prescribed means of take, mitigation measures, and monitoring requirements; or not issue the Authorization) considered in this EA on the relevant requirements in section 101(a)(5)(D) of the MMPA. Thus, our authority under the MMPA bounds the scope of our alternatives. We conclude that this analysis—when combined with the analyses in the following documents—fully describes the impacts associated with the proposed seismic survey program with mitigation and monitoring for sea otters. After conducting an independent review of the information and analyses for sufficiency and adequacy, we incorporate by reference the relevant analyses on SAE's proposed action as well as a discussion of the affected environment and environmental consequences within the following documents:

- our notice of the proposed Authorization in the *Federal Register*;
- *Application for the Incidental Harassment Authorization for the Taking of Sea Otters in Conjunction with the SAE Proposed 3D Seismic Survey in Cook Inlet, Alaska, 2014* (SAE/Owl Ridge NRC, 2013);
- *Northern Sea Otter (Enhydra lutris kenyoni): Southcentral Alaska Stock* (USFWS 2014).

MMPA APPLICATION AND NOTICE OF THE PROPOSED AUTHORIZATION

The CEQ regulations (40 CFR §1502.25) encourage federal agencies to integrate NEPA's environmental review process with other environmental review laws. We rely substantially on the public process for developing proposed Authorizations and evaluating relevant environmental information and provide a meaningful opportunity for public participation as we develop corresponding EAs. We fully consider public comments received in response to our publication of the notice of proposed Authorization during the corresponding NEPA process.

On [date], we published a notice of proposed Authorization in the *Federal Register* ([volume]), which included the following:

- a detailed description of the proposed action and an assessment of the potential impacts on sea otters and the availability of sea otters for subsistence uses;
- plans for SAE's mitigation and monitoring measures to avoid and minimize potential adverse impacts to sea otters and their habitat and proposed reporting requirements; and
- our preliminary findings.

We considered SAE's proposed mitigation and monitoring measures that would affect the least practicable impact on sea otters including: (1) establishing 180-dB radii exclusion zones for, respectively; (2) monitoring by protected species observers (PSOs) for sea otter that would enter these exclusion zones; (3) power-down or shut-down of acoustic sources if a sea otter is sighted within or is about to enter the applicable exclusion zones; (4) ramping up sound sources before the survey; and (5) delays power-ups until the 180-dB radii exclusion zone is clear of otters. Through the MMPA process, we preliminarily determined — provided that SAE implements the required mitigation and monitoring measures — that the impact on sea otters of conducting the proposed 3D seismic survey in Cook Inlet, Alaska, from August 15 to December 15, 2014, would result, at worst, in a modification in behavior and/or low-level physiological effects (Level B harassment) of sea otters. Also through that process, we determined that the activity would not have an unmitigable adverse impact on the availability of sea otters for subsistence uses.

Within our notice, we requested that the public submit comments, information, and suggestions concerning SAE's request, the content of our proposed Authorization, and potential environmental effects related to the proposed issuance of the Authorization. This SAE EA incorporates by reference and relies on SAE's application (SAE/Owl Ridge NRC 2013) and our notice of a proposed Authorization ([date]).

In summary, those analyses concluded that with incorporation of monitoring and mitigation measures proposed by SAE, the authorized taking of sea otters results in minor, short-term (recoverable) adverse effects on individual sea otters. Next, the Authorization would not result in individually insignificant, but cumulatively significant impacts, or in cumulative adverse effects that could have a substantial effect on the target species or non-target species. The frequency and duration of the harassment from the seismic survey should allow adequate time for the sea otters to recover from potentially adverse effects. Further, the analyses concluded that USFWS did not expect that additive or cumulative effects of the seismic survey on its own or in combination with other activities would occur. Finally, the environmental analyses did not identify any significant environmental issues or impacts.

1.3.2. Scope of Environmental Analysis

Given the limited scope of the decision for which we are responsible (*i.e.*, issue the Authorization including prescribed means of take, mitigation measures, and monitoring requirements; not issue the Authorization; or issue the Authorization with additional mitigation measures) this EA intends to provide more focused information on the primary issues and

impacts of environmental concern related specifically to our issuance of the Authorization. This EA does not further evaluate effects to the elements of the human environment listed in Table 1 because previous environmental reviews, incorporated by reference (NMFS 2008a,b,c, 2013a,b) have shown that our limited action of issuing an Authorization to SAE or SAE's proposed action would not significantly affect those components of the human environment.

Table 1. Components of the human environment not affected by our issuance of an Authorization.

Biological	Physical	Socioeconomic / Cultural
Amphibians	Air Quality	Commercial Fishing
Humans	Essential Fish Habitat	Military Activities
Non-Indigenous Species	Geography	Oil and Gas Activities
Seabirds	Land Use	Recreational Fishing
	Oceanography	Shipping and Boating
	State Marine Protected Areas	National Historic Preservation Sites
	Federal Marine Protected Areas	National Trails and Nationwide Inventory of Rivers
	National Estuarine Research Reserves	Low Income Populations
	National Marine Sanctuaries	Minority Populations
	Park Land	Indigenous Cultural Resources
	Prime Farmlands	Public Health and Safety
	Wetlands	Historic and Cultural Resources
	Wild and Scenic Rivers	
	Ecologically Critical Areas	

1.3.3. NEPA Public Scoping Summary

We requested comments on the potential environmental impacts described in SAE's MMPA application and in the *Federal Register* notice of the proposed Authorization. The CEQ regulations further encourage agencies to integrate the NEPA review process with review under the environmental statutes. Consistent with agency practice we integrated our NEPA review and preparation of this EA with the public process required by the MMPA for the proposed issuance of an Authorization.

The *Federal Register* notice of the proposed Authorization, combined with our preliminary determinations, supporting analyses, and corresponding public comment period are instrumental in providing the public with information on relevant environmental issues and offering the public

a meaningful opportunity to provide comments to us for consideration in both the MMPA and NEPA decision-making processes.

The *Federal Register* notice of the proposed Authorization summarizes our proposed action; states that we would prepare an EA for the proposed action; and invites interested parties to submit written comments concerning the application and our preliminary analyses and findings including those relevant to consideration in the EA. After the conclusion of the public comment and review process, we will incorporate public comments and post the final EA, and, if appropriate, FONSI, on our website at: http://www.fws.gov/alaska/fisheries/mmm/iha.htm.

1.4. Other Permits, Licenses, or Consultation Requirements

This section summarizes federal, state, and local permits, licenses, approvals, and consultation requirements necessary to implement the proposed action.

1.4.1. National Environmental Policy Act

Issuance of an Authorization is subject to environmental review under NEPA. USFWS may prepare an EA, an EIS, or determine that the action is categorically excluded from further review. While NEPA does not dictate substantive requirements for an Authorization, it requires consideration of environmental issues in federal agency planning and decision making. The procedural provisions outlining federal agency responsibilities under NEPA are provided in the CEQ's implementing regulations (40 CFR §§1500-1508).

1.4.2. Endangered Species Act

Section 7 of the ESA and implementing regulations at 50 CFR §402 require consultation with the appropriate federal agency (either NMFS or USFWS) for federal actions that "may affect" a listed species or critical habitat. USFWS' issuance of an Authorization affecting ESA-listed species or designated critical habitat, directly or indirectly, is a federal action subject to these section 7 consultation requirements. Accordingly, USFWS is required to ensure that its action is not likely to jeopardize the continued existence of any threatened or endangered species or result in destruction or adverse modification of critical habitat for such species. However, sea otters in the SAE's proposed seismic survey area are not listed under ESA, and listed species under NMFS' jurisdiction are addressed in a separate IHA and EA process with that agency.

1.4.3. Marine Mammal Protection Act

The MMPA and its provisions that pertain to the proposed action are discussed above in section 1.2.

1.4.4. Magnuson-Stevens Fishery Conservation and Management Act

Under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), Federal agencies are required to consult with the Secretary of Commerce with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such

agency which may adversely affect essential fish habitat (EFH) identified under the MSFCMA. EFH has been identified in Cook Inlet for walleye Pollock, rock sole, Pacific cod, skate, weathervane scallop, Pacific salmon, and sculpin. USFWS' action of authorizing harassment of sea otters in the form of an Authorization does not impact EFH; therefore, an EFH consultation was not conducted.

Chapter 2 Alternatives

2.1. Introduction

The NEPA and the implementing CEQ regulations (40 CFR §§ 1500-1508) require consideration of alternatives to proposed major federal actions and 516 DM6 Appendix 1 provides agency policy and guidance on the consideration of alternatives to our proposed action. An EA must consider all reasonable alternatives, including Alternative 1 (Preferred Alternative). It must also consider the No Action Alternative, even if it that alternative does not meet the stated purpose and need. This provides a baseline analysis against which we can compare the other alternatives.

To warrant detailed evaluation as a reasonable alternative, an alternative must meet our purpose and need. In this case, as we previously explained in Chapter 1 of this EA, an alternative only meets the purpose and need if it satisfies the requirements under section 101(a)(5)(D) the MMPA. We evaluated each potential alternative against these criteria; identified two action alternatives along with the No Action Alternative; and carried these forward for evaluation in this EA.

Alternative 1 includes a suite of mitigation measures intended to minimize potentially adverse interactions with sea otters. Alternative 1 is described in this chapter.

As described in Section 1.2.1, we must prescribe the means of effecting the least practicable impact of sea otters and their habitat. In order to do so, we must consider SAE's proposed mitigation measures, as well as other potential measures, and assess how such measures could benefit the affected species or stocks and their habitat. Our evaluation of potential measures includes consideration of the following factors in relation to one another: (1) the manner in which, and the degree to which, we expect the successful implementation of the measure to minimize adverse impacts to sea otters; (2) the proven or likely efficacy of the specific measure to minimize adverse impacts as planned; and (3) the practicability of the measure for applicant implementation.

Any additional mitigation measure proposed by us beyond what the applicant proposes should be able to or have a reasonable likelihood of accomplishing or contributing to the accomplishment of one or more of the following goals:

- Avoidance or minimization of sea otter injury, serious injury, or death wherever possible;
- A reduction in the numbers of sea otters taken (total number or number at biologically important time or location);
- A reduction in the number of times the activity takes individual sea otters (total number or number at biologically important time or location);
- A reduction in the intensity of the anticipated takes (either total number or number at biologically important time or location);
- Avoidance or minimization of adverse effects to sea otter habitat, paying special attention to the food base; activities that block or limit passage to or from biologically important

areas; permanent destruction of habitat; or temporary destruction/disturbance of habitat during a biologically important time; and

- For monitoring directly related to mitigation, an increase in the probability of detecting sea otters, thus allowing for more effective implementation of the mitigation.

2.2. Description of SAE's Proposed Activities

We presented a general overview of SAE's proposed 3D seismic survey operations in our *Federal Register* notice of proposed Authorization ([date]). We incorporate those descriptions by reference in this EA and briefly summarize them here.

2.2.1. Specified Time and Specified Area

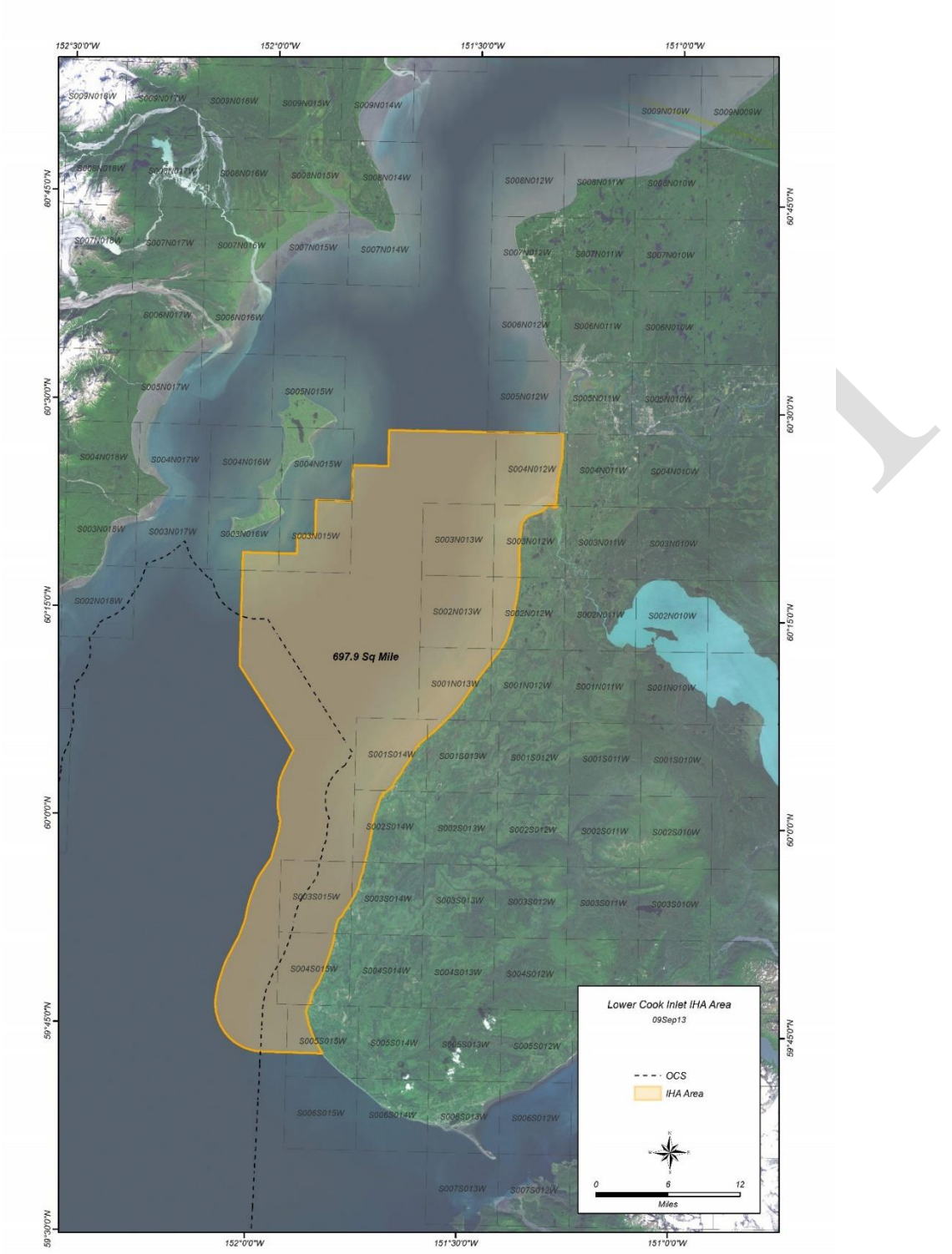
SAE proposes to acquire offshore/transition zone seismic data in waters offshore of the Kenai Peninsula from August 15 to December 15, 2014. During each 24-hour period, seismic support activities may be conducted throughout the entire period; however, in-water airguns would only be active for approximately 2-3 hours during each of the slack tide periods. There are approximately four slack tide periods in a 24-hour period; therefore, airgun operations would be active during approximately 8-12 hours per day, if weather conditions allow.

SAE's proposed 3D seismic surveys would occur in intertidal transition zone and marine environment areas of Cook Inlet, Alaska (as well as some on land portions that are not considered in this EA). The proposed location of SAE's acquisition plan has been divided into areas denoted as Zone 1 and Zone 2. Zone 1 is located in mid-Cook Inlet and extends on the east coast from approximately 10 km (6.2 mi) south of Point Possession to 25 km (15.5 mi) north of the East Foreland. This zone is not inhabited by sea otters and, therefore, is not relevant to this EA. Zone 2 (Figure 1) begins 25 km (15.5 mi) north of the East Foreland on both the east and west coasts and extends down to approximately Harriet Point on the west coast and to an area about 12 km (7.5 mi) north of Homer. Although SAE would only operate in a portion of this entire area between August 15 and December 15, 2014, SAE has requested to operate in this entire region in order to allow for operational flexibility. There are numerous factors that influence the survey areas, including the geology of the Cook Inlet area, other permitting restrictions (*i.e.*, commercial fishing, Alaska Department of Fish and Game refuges), seismic imaging of leases held by other entities with whom SAE has agreements (*e.g.*, data sharing), overlap of sources and receivers to obtain the necessary seismic imaging data, and general operational restrictions (ice, weather, environmental conditions, marine life activity, etc.). Water depths for the program range from 0-128 m (0-420 ft).

2.2.2. 3D Seismic Survey Operations

During the survey operation, vessels would lay and retrieve nodal sensors on the sea floor in periods of low current, or, in the case of the intertidal area, during high tide over a 24-hour period. SAE proposes to use two synchronized vessels. Each source vessel would be equipped with compressors and 1,760 cubic inch (in^3) airgun arrays. Additionally, one of the source vessels would be equipped with a 440 in^3 shallow water source array, which can be deployed at

high tide in the intertidal area in less than 1.8 m (6 ft) of water. The two source vessels do not fire the airguns simultaneously; rather, each vessel fires a shot every 24 seconds, leaving 12 seconds between shots. The operation would utilize two source vessels, three cable/nodal deployment and retrieval operations vessels, a mitigation/monitoring vessel, a node re-charging and housing vessel, and two small vessels for personnel transport and node support in the extremely shallow waters in the intertidal area.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60°15'0"N
60°0'0"N
59°45'0"N
59°30'0"N
697.9 Sq Mile
Lower Cook Inlet IHA Area
09Sep13
OCS
IHA Area
0
6
12
Miles

Figure 1. Proposed Project Area for SAE's 2014 3D Seismic Survey Program

2.3. Description of Alternatives

2.3.1. Alternative 1 – Issuance of an Authorization with Mitigation Measures

The Proposed Action constitutes Alternative 1 and is the Preferred Alternative. Under this alternative, we would issue an Authorization (valid from August 15 through December 15, 2014) to SAE allowing the incidental take, by Level B harassment, of sea otters subject to the mandatory mitigation and monitoring measures and reporting requirements set forth in the proposed Authorization, if issued, along with any additions based on consideration of public comments.

Our *Federal Register* notice requesting comments on the proposed Authorization analyzed the potential impacts of this Alternative in detail. We incorporate those analyses by reference in this EA and briefly summarize the mitigation and monitoring measures and reporting requirements that we would incorporate in the final Authorization, if issued, in the following sections.

MITIGATION AND MONITORING MEASURES

To reduce the potential for disturbance from acoustic stimuli associated with the activities, SAE has proposed to implement several monitoring and mitigation measures for sea otters. USFWS has proposed some additional measures. The proposed monitoring and mitigation measures include:

(1) Utilize trained, vessel-based Protected Species Observers (PSOs) to visually watch for and monitor sea otters near the seismic source vessels during daytime operations (from nautical twilight-dawn to nautical twilight-dusk) and before and during start-ups of sound sources day or night. Two PSOs would be on each source vessel, and two PSOs would be on the support vessel to observe the exclusion and disturbance zones. When practicable, as an additional means of visual observation, SAE's vessel crew may also assist in detecting sea otters.

(2) Establish a 190 dB re 1 µPa (rms) "exclusion zone" (EZ) for sea otters before the full array (1,760 in^3) is in operation; and an additional 190 dB re 1 µPa (rms) EZ before the 440 in^3 is in operation, respectively.

(3) Visually observe the entire extent of the EZ using qualified PSOs, for at least 30 minutes (min) prior to starting the airgun array (day or night). If the PSO finds a sea otter within the EZ, SAE must delay the seismic survey until the sea otter(s) has left the area. If the PSO sees a sea otter that surfaces, then dives below the surface, the PSO shall wait 30 min. If the PSO sees no sea otters during that time, they should assume that the animal has moved beyond the EZ. If for any reason the entire radius cannot be seen for the entire 30 min (*i.e.*, rough seas, fog, darkness), or if sea otters are near, approaching, or in the EZ, the airguns may not be ramped-up.

(4) Implement a "ramp-up" procedure when starting up at the beginning of seismic operations or any time after the entire array has been shut down for more than 10 min, which means start the smallest sound source first and add sound sources in a sequence such that the source level of the array shall increase in steps not exceeding approximately 6 dB per 5-min period. During ramp-up, the PSOs shall monitor the EZ, and if sea otters are sighted, a power-down, or shutdown shall be implemented as though the full array were operational. Therefore, initiation of ramp-up procedures from shutdown requires that the PSOs be able to visually observe the full EZ as described above.
(5) Alter speed or course during seismic operations if a sea otter, based on its position and relative motion, appears likely to enter the relevant EZ. If speed or course alteration is not safe or practicable, or if after alteration the sea otter still appears likely to enter the EZ, further mitigation measures, such as a power-down or shutdown, shall be taken.
(6) Power-down or shutdown the sound source(s) if a sea otter is detected within, approaches, or enters the relevant EZ. A shutdown means all operating sound sources are shut down (*i.e.*, turned off). A power-down means reducing the number of operating sound sources to a single operating 10 in^3 airgun, which reduces the EZ to the degree that the sea otter(s) is no longer in or about to enter it.
(7) Following a power-down, if the sea otter approaches the smaller designated EZ, the sound sources must then be completely shut down. Seismic survey activity shall not resume until the PSO has visually observed the sea otter(s) exiting the EZ and is not likely to return, or has not been seen within the EZ for 15 min.
(8) Following a power-down or shutdown and subsequent animal departure, survey operations may resume following ramp-up procedures described above.
(9) Marine geophysical surveys may continue into night and low-light hours if such segment(s) of the survey is initiated when the entire relevant EZs can be effectively monitored visually (*i.e.*, PSO(s) must be able to see the extent of the entire relevant EZ).

SAE proposes to sponsor marine mammal monitoring during the present project, in order to implement the mitigation measures that require real-time monitoring and to satisfy the monitoring requirements of the Authorization. The researchers would monitor the area for sea otters during all activities. Monitoring would be conducted from the source vessels and attending mitigation vessel. Monitoring data would include the following:

(1) Species, group size, age/size/sex categories (if determinable), behavior when first sighted and after initial sighting, heading (if consistent), bearing and distance from seismic vessel, sighting cue, apparent reaction to the airguns or vessel (e.g., none, avoidance, approach, paralleling, etc., and including responses to ramp-up), and behavioral pace; and
(2) Time, location, heading, speed, activity of the vessel (including number of airguns operating and whether in state of ramp-up or power-down), Beaufort sea state and wind force, visibility, and sun glare. These data shall also be recorded at the start and end of

each observation watch and during a watch whenever there is a change in one or more of the variables.

REPORTING MEASURES

SAE would submit a weekly field report, no later than close of business each Thursday during the weeks when in-water seismic survey activities take place. The field reports would summarize species detected, in-water activity occurring at the time of the sighting, behavioral reactions to in-water activities, and the number of sea otters taken. These reports must contain and summarize the following information:

(1) Dates, times, locations, heading, speed, weather, sea conditions (including Beaufort sea state and wind force), and associated activities during all seismic operations and marine mammal sightings;
(2) Species, number, location, distance from the vessel, and behavior of any sea otters, as well as associated seismic activity (number of power-downs and shutdowns), observed throughout all monitoring activities;
(3) An estimate of the number of sea otters that have been exposed to the seismic activity (based on visual observation) at received levels greater than or equal to 160 dB re 1 µPa (rms) and 190 dB re 1 µPa (rms) with a discussion of any specific behaviors those individuals exhibited.

After conclusion of the seismic survey and the effectiveness of the Authorization, SAE would submit a draft Technical Report on all activities and monitoring results to the USFWS Marine Mammals Management Office (MMM) within 90 days. The Technical Report would include:

(1) Summaries of monitoring effort (e.g., total hours, total distances, and marine mammal distribution through the study period, accounting for sea state and other factors affecting visibility and detectability of sea otters);
(2) Analyses of the effects of various factors influencing detectability of sea otters (e.g., sea state, number of observers, and fog/glare);
(3) Species composition, occurrence, and distribution of marine mammal sightings, including date, water depth, numbers, age/size/gender categories (if determinable), group sizes, and ice cover;
(4) Analyses of the effects of survey operations; and
(5) Sighting rates of sea otters during periods with and without seismic survey activities (and other variables that could affect detectability), such as: (A) initial sighting distances versus survey activity state; (B) closest point of approach versus survey activity state; (C) observed behaviors and types of movements versus survey activity state; (D) numbers of sightings/individuals seen versus survey activity state; (E) distribution around the source vessels versus survey activity state; and (F) estimates of take by Level B harassment based on presence in the 160 dB harassment zone.

USFWS would review the draft 90-day Technical Report. SAE must then submit a final report to the USFWS within 30 days after receiving comments from USFWS on the draft report. If USFWS decides that the draft report needs no comments, the draft report shall be considered to be the final report.

In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by this Authorization, such as an injury (Level A harassment), serious injury, or mortality (*e.g.*, ship-strike, gear interaction, and/or entanglement), SAE shall immediately cease the specified activities and immediately report the incident to the USFWS MMM. The report must include the following information:

(1) Time, date, and location (latitude/longitude) of the incident;
(2) The name and type of vessel involved;
(3) The vessel's speed during and leading up to the incident;
(4) Description of the incident;
(5) Status of all sound source use in the 24 hours preceding the incident;
(6) Water depth;
(7) Environmental conditions (e.g., wind speed and direction, Beaufort sea state, cloud cover, and visibility);
(8) Description of sea otter observations in the 24 hours preceding the incident;
(9) Species identification or description of the animal(s) involved;
(10) The fate of the animal(s); and
(11) Photographs or video footage of the animal (if equipment is available).

Activities shall not resume until USFWS is able to review the circumstances of the prohibited take. USFWS shall work with SAE to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. SAE may not resume their activities until notified by USFWS via letter or email, or telephone.

In the event that SAE discovers an injured or dead marine mammal, and the lead PSO determines that the cause of the injury or death is unknown and the death is relatively recent (*i.e.*, in less than a moderate state of decomposition as described in the next paragraph), SAE would immediately report the incident to the USFWS MMM. The report must include the same information identified in the Condition 9(a) above. Activities may continue while USFWS reviews the circumstances of the incident. USFWS would work with SAE to determine whether modifications in the activities are appropriate.

In the event that SAE discovers an injured or dead marine mammal, and the lead PSO determines that the injury or death is not associated with or related to the authorized activities (e.g., previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), SAE shall report the incident to the USFWS MMM within 24 hours of the discovery. SAE shall provide photographs or video footage (if available) or other documentation of the

stranded animal sighting to USFWS. Activities may continue while USFWS reviews the circumstances of the incident.

In our *Federal Register* notice of proposed Authorization, which we incorporate by reference, we preliminarily determined that the measures included in the proposed Authorization were sufficient to reduce the effects of SAE's activity on sea otters to the level of least practicable impact. In addition, we described our analysis of impacts and preliminarily determined that the taking of small numbers of sea otters, incidental to SAE's action would have a negligible impact on the relevant species or stocks and would not have an unmitigable adverse impact on affected species or stocks for taking for subsistence uses.

The Preferred Alternative would satisfy the purpose and need of our proposed action under the MMPA–issuance of an Authorization, along with required mitigation measures and monitoring that meets the standards set forth in section 101(a)(5)(D) of the MMPA and the implementing regulations.

2.3.2. Alternative 2 – No Action Alternative

We are required to evaluate the No Action Alternative per CEQ NEPA regulations. The No Action Alternative serves as a baseline to compare the impacts of the Preferred and other Alternatives.

Under the No Action Alternative, SAE could choose not to proceed with their proposed activities or to proceed without an Authorization. If they choose the latter, SAE would not be exempt from the MMPA prohibitions against the take of sea otters and would be in violation of the MMPA if take of sea otters occurs.

For purposes of this EA, we characterize the No Action Alternative as SAE not receiving an Authorization and SAE conducting the Cook Inlet 3D seismic survey program without the protective measures and reporting requirements required by an Authorization under the MMPA. We take this approach to meaningfully evaluate the primary environmental issues—the impact on sea otters from these activities in the absence of protective measures.

2.4. Alternatives Considered but Eliminated from Further Consideration

USFWS considered whether other alternatives could meet the purpose and need and support SAE's proposed activities. An alternative that would allow for the issuance of an Authorization with no required mitigation or monitoring was considered but eliminated from consideration, as it would not be in compliance with the MMPA and therefore would not meet the purpose and need. For that reason, this alternative is not analyzed further in this document.

Chapter 3 Affected Environment

This chapter describes existing conditions in the proposed action areas. Complete descriptions of the physical, biological, and social environment of the action area are contained in the documents listed in Section 1.3.1 of this SAE EA. We incorporate those descriptions by reference and briefly summarize or supplement the relevant sections for sea otters in the following subchapters.

3.1. Physical Environment

As discussed in Chapter 1, our proposed action and alternative relate only to the authorization of incidental take of sea otters and not to the physical environment. Certain aspects of the physical environment are not relevant to our proposed action (see subchapter 1.3.2 - Scope of Environmental Analysis). We briefly summarize the physical components of the environment here.

3.1.1. Sea Otter Habitat

We presented information on sea otter habitat and the potential impacts to sea otter habitat in the *Federal Register* notice of the proposed Authorization.

3.2. Biological Environment

3.2.1. Sea Otters

Gorbics and Bodkin (2001) determined that the sea otters inhabiting Cook Inlet are members of the unlisted Southcentral Alaska Stock. This stock extends from Cape Yakataga to the eastern shoreline of lower Cook Inlet, and includes Prince William Sound and the Kenai Peninsula coast (Allen and Angliss 2013). Sea otter populations found along the western shoreline of lower Cook Inlet, including Kamishak Bay, are part of the listed Southwest Alaska Stock. The most recent population estimate (2000-2003) for this stock is 15,090 (Allen and Angliss 2013). While this stock was thought to be stabilizing by 2002 (Bodkin et al. 2002) after several decades of growth (Irons et al. 1988, Bodkin and Udevitz 1999), the Kachemak Bay population alone increased 26 percent annually between 2002 and 2008, with the most recent bay estimate at about 3,600 animals (Gill et al. 2009). However, until recently, only a very small fraction of these otters were recorded north of Anchor Point (Rugh et al. 2005, Gill et al. 2009, Doroff and Badajos 2010), especially during the winter (Hansen and Hubbard 1999, Larned 2006). Doroff and Badajos (2010) tracked 44 radio-tagged sea otters in Kachemak Bay for three years and did not find any of them to travel north of Anchor Point. In 2004 and 2005, Larned (2006) recorded sea otters during intensive (approximately 30 percent area coverage) winter (December to April) surveys for Steller's eiders between Anchor Point and Clam Gulch. The survey teams observed an average of less than 8 otters per survey month (9 months total). The highest estimate was 92 otters inhabiting about 300 square kilometers north of Anchor Point during December 2004. During June surveys for beluga whales conducted between 1993 and 2004, Rugh et al. (2005) recorded 2,111 sea otters in lower Cook Inlet, but virtually none north of Anchor Point (although the length of the Kenai Peninsula was surveyed each year).

However, recent (2013) marine mammal monitoring (for the Cosmopolitan State exploratory drilling program) conducted 3 miles offshore of Cape Starichkof revealed that during July and August, relatively large numbers of sea otters can be found riding the tides between Anchor Point and some point well north of Cape Starichkof. It is likely that this late summer phenomenon is a result of seasonal weather conditions that allow otters to safely ride the daily tides to foraging grounds outside Kachemak Bay. Since none of the previous surveys were conducted during the fall, it is unknown how late into fall large numbers of sea otters are found north of Anchor Point. Doroff and Badajos (2010) could not relocate 10 of the radio-tagged otters in August 2009 but these were subsequently relocated in September 2009. It is possible that these otters had moved north of Anchor Point (outside the study area) during August, only to return to Kachemak Bay in September.

3.3. Socioeconomic Environment

3.3.1. Subsistence

The proposed seismic activities will occur near the marine subsistence areas used by the villages of Homer, Ninilchik, and Kenai. The MMPA permits Alaska Natives to harvest sea otters for subsistence purposes or for the purposes of creating authentic Native articles of handicrafts and clothing, provided this is accomplished in a non-wasteful manner. There are no harvest quotas for Cook Inlet sea otters, but dozens are taken there annually. Between 1989 and 2013 (26 years), villagers from Homer harvested 613 otters, while Kenai reported 31 and Ninilchik 16 otters harvested. It is likely the nearly all the harvest of otters by Homer hunters occurred inside Kachemak Bay.

Given the very low number of otters (~1/year) harvested by villages that are located adjacent to the action area (Kenai and Ninilchik), SAE's planned seismic exploration activities will not impact the availability of sea otters for subsistence harvest in Cook Inlet. The impact of seismic operations is unlikely to affect any sea otter sufficient to render it unavailable for subsistence harvest in the future.

Chapter 4 Environmental Consequences

This chapter of the EA analyzes the impacts of the two alternatives and addresses the potential direct, indirect, and cumulative impacts of our issuance of an Authorization. SAE's application, our notice of a proposed Authorization, and other related environmental analyses identified previously, facilitate an analysis of the direct, indirect, and cumulative effects of our proposed issuance of an Authorization.

Under the MMPA, we have evaluated the potential impacts of SAE's seismic survey activities in order to determine whether to authorize incidental take of sea otters. Under NEPA, we have determined that an EA is appropriate to evaluate the potential significance of environmental impacts resulting from the issuance of our Authorization.

4.1. Effects of Alternative 1 – Issuance of an Authorization with Mitigation Measures

Alternative 1 is the Preferred Alternative where we would issue an Authorization to SAE allowing the incidental take, by Level B harassment, of sea otters from August 15 to December 15, 2014, subject to the mandatory mitigation and monitoring measures and reporting requirements set forth in the Authorization, if issued. We would incorporate the mitigation and monitoring measures and reporting described earlier in this EA into a final Authorization.

4.1.1. Impacts to Sea Otter Habitat

Our proposed action would have no additive or incremental effect on the physical environment beyond those resulting from the proposed activities. SAE's proposed seismic survey area is not located within a marine sanctuary or a National Park. State wildlife conservation areas have been designated in Cook Inlet; however, those occur mostly on land with some portions along the coasts and would not be impacted by our proposed action of the issuance of an Authorization to take sea otters. The proposed seismic survey would minimally add to vessel traffic in the region. The proposed activities would not result in substantial damage to ocean and coastal habitats that might constitute sea otter habitat. Placement and retrieval of the nodes may cause temporary and localized increases in turbidity on the seafloor; however, the turbidity created by placing and removing nodes on the seafloor would settle to background levels within minutes after the cessation of activity. We do not anticipate that the 3D seismic survey operations would physically alter the marine environment or negatively impact the physical environment in the proposed action area. The Authorization would not impact physical habitat features, such as substrates and/or water quality. More information on potential impacts to marine mammal habitat is contained in SAE's application (SAE/Owl Ridge NRC 2013) and our proposed Authorization notice, which are incorporated herein by reference.

4.1.2. Impacts to Sea Otters

We expect that disturbance from acoustic stimuli associated with the 3D seismic survey program have the potential to impact marine mammals. Acoustic stimuli generated by the airgun arrays (and to a lesser extent the pingers) may affect marine mammals in one or more of the following ways: tolerance, masking of natural sounds, behavioral disturbance, and temporary or permanent

hearing impairment, or non-auditory physical effects (Richardson et al. 1995). Our notice of proposed Authorization and SAE's application (SAE/Owl Ridge NRC 2013) provide detailed descriptions of these potential effects of seismic surveys on sea otters. That information is incorporated herein by reference and summarized next.

The primary potential impact of the proposed SAE seismic operations to local sea otters is impulsive acoustical harassment from the operating 1,760-cubic-inch air guns. Although the requested "take" (270) represents only a negligible 1.79 percent of the total estimated stock population (15,090), what is known about the sea otter's behavioral responses to noise stimuli is addressed below. Disruptions are not likely to be significant enough to rise to the level of a "take" unless the sound source displaces a marine mammal from an important feeding or breeding area for a prolonged period, and this project is unlikely to do so. Further, the requested "take" is based on the distribution of otters relative to the air guns, and does not take into account most of those otters would be at the surface and unaffected by underwater noise.

Previous work suggests that sea otters may be less responsive to marine seismic pulses than some other marine mammals, such as mysticetes and odontocetes. Riedman (1983, 1984) monitored the behavior of sea otters along the California coast while they were exposed to a single 100-cubic-inch air gun and a 4,089-cubic-inch air gun array. No disturbance reactions were evident when the air gun array was as close as 0.9 kilometers. Sea otters also did not respond noticeably to the single air gun. Sea otters spend a great deal of time at the surface feeding and grooming (Riedman 1983, 1984; Wolt et al. 2012). While at the surface, the potential noise exposure of sea otters would be much reduced by pressure-release and interference (Lloyd's mirror) effects at the surface (Greene and Richardson 1988; Richardson et al. 1995). Finally, the average dive time of a northern sea otter has been measured at only 85 seconds (Bodkin et al. 2004) to 149 seconds (Wolt et al. 2007), thereby limiting exposure during active seismic operations. It remains unclear whether seismic generated sound levels even rise to the level of harassment "take" at distances beyond 0.9 kilometers, given the animal's poor underwater hearing ability and surface behavior.

Noise has the potential to induce temporary threshold shift (TTS) or permanent threshold shift (PTS) hearing loss (Weilgart 2007). The level of loss is dependent on sound frequency, intensity, and duration. Similar to masking, hearing loss reduces the ability for marine mammals to forage efficiently, maintain social cohesion, and avoid predators (Weilgart 2007).

TTS could occur as a result of SAE's seismic operations, but there is no information on TTS impacts to sea otters, an animal that spends much time at the surface. The average dive time of a northern sea otter, the period the otter's ears would be underwater and exposed to underwater sounds, is only 85 seconds (Bodkin et al. 2004) to 149 seconds (Wolt et al. 2012). Wolt et al. (2012) found Prince William Sound sea otters to average 8.6 dives per feeding bout. Multiplied by the average dive time (149 seconds), the average total time a sea otter spends underwater during a feeding bout is about 21 minutes, or 12 to 18 percent of the time of a typical 2 to 3 hour

slack-tide seismic shoot. Except for loud screams between pups and mothers (McShane et al. 1995), sea otters do not appear to communicate vocally, either at the surface or under water, and they do not use sound to detect prey. Thus, any TTS due to seismic noise is unlikely to mask communication or reduce foraging efficiency. Finally, sea otters are unlikely to rely on sound to detect and avoid predators. For example, sea otters at the surface are not likely to hear killer whale vocalizations.

PTS occurs when continuous noise exposure causes hairs within the inner ear system to die. This can occur due to moderate durations of very loud noise levels, or long-term continuous exposure of moderate noise levels. However, PTS is also not an issue with sea otters and impulsive seismic noise. Sea otter exposure to underwater noises generated by vessels (propellers) would be of very short duration because the average dive time of a northern sea otter is only 85 seconds (Bodkin et al. 2004) to 149 seconds (Wolt et al. 2012).

Airborne exposure is also of little concern since pressure release and Lloyd's mirror-effect will reduce underwater seismic noise transmitted to the air. Riedman's (1983, 1984) observations of sea otters lack of reaction to seismic noise was likely due largely to these transmission limits.

Masking occurs when louder noises interfere with marine mammal vocalizations or their ability to hear natural sounds in their environment (Richardson et al. 1995). These noise levels limit their ability to communicate and/or avoid predation or other natural hazards. However, as mentioned above, sea otters do not vocally communicate underwater (Ghoul and Reichmuth 2012) and masking due to exposure to underwater noise is not relevant.

Sea otters do communicate above water with the loud screams between separated mothers and pups of most importance (McShane et al. 1995). Ghoul and Reichmuth (2012) measured these vocalizations and found that the intensity of these calls ranged between 50 and 113 dB SPL re 20 µPa, and were loud enough that they can be heard by humans at distances exceeding 1 kilometer (McShane et al. 1995). Any potential masking effect from any noise entering the air from the seismic guns would be brief (a shot) and would likely disappear a few meters from the source.

Injury: SAE did not request authorization to take sea otters by injury (Level A harassment), serious injury, or mortality. Based on the results of our analyses, SAE's environmental analyses, and previous monitoring reports for the same activities, there is no evidence that SAE's planned activities could result in injury, serious injury, or mortality within the action area. The required mitigation and monitoring measures would minimize any potential risk for sea otters.

Vessel Strikes: The potential for striking sea otters is generally not a concern with vessel traffic. Studies have associated ship speed with the probability of a ship strike resulting in an injury or mortality of an animal. However, while vessel strikes of sea otters have been reported, the typical vessel speeds of the source vessels while collecting seismic data is between 2-4 knots, or slow enough for otters to avoid. Moreover, mitigation measures would be required of SAE to reduce speed or alter course if collisions with sea otters appear likely.

Estimated Take of Sea Otters by Level B Incidental Harassment: SAE has requested take by Level B harassment as a result of the acoustic stimuli generated by their proposed seismic survey. We expect that the survey would cause a short-term behavioral disturbance for sea otters in the proposed areas.

As mentioned previously, we estimate that the activities could potentially affect, by Level B harassment only, sea otters under our jurisdiction. Table 3 outlines the number of Level B harassment takes that we propose to authorize in this Authorization, the regional (Southcentral Alaska Stock) population estimate for sea otters in the action area, and the percentage of the stock that may be taken as a result of SAE's activities.

Table 2. Proposed Level B harassment take levels and sea otter stock abundance.

Species	Proposed Level B Take	Abundance
Sea Otter	2,778	713

Our proposed Authorization notice and SAE's application (SAE/Owl Ridge NRC 2013) contain complete descriptions of how these take estimates were derived.

4.1.3. Impacts on Subsistence

Under the Alternative 1 (the Preferred Alternative), SAE's seismic survey in the Cook Inlet is expected to have minor and temporary effects on subsistence wildlife and sea otters in the area. Sound from seismic activities and array guns might temporarily displace wildlife from the area, but animals are expected to return to the area following the cessation of use of sound sources during survey activities. Residents of the villages of Homer, Kenai, and Ninilchik are the primary marine mammal subsistence users in the Action Area. Sea otter subsistence harvest is allowed under Section 109 of the MMPA, as long as the harvest is not wasteful. All otters harvested are to be reported to the USFWS within 30 days where the pelt is tagged. For the past 26 years, subsistence hunters from the village of Homer have taken an average of 24 otters per year, probably nearly all within Kachemak Bay. The two villages on the Kenai Peninsula, closer to where the seismic work would occur, harvested about one or less otters per year, with over half the Kenai harvest (17) occurring in one year (2012). Only one otter was reported harvested by Ninilchik subsistence hunters over the past five years (2008-2013).

SAE has identified the following features that are intended to reduce impacts to marine mammal subsistence users:

• In-water seismic activities would follow mitigation procedures to minimize effects on the behavior of sea otters and, therefore, opportunities for harvest by Alaska Native communities; and

• Regional subsistence representatives may support recording marine mammal observations along with marine mammal biologists during the monitoring programs and would be provided with annual reports.

SAE concluded, and the USFWS agrees, that the size of the affected area, mitigation measures, and input from the consultations from Alaska Natives should result in the proposed action having no unmitigable adverse impact on the availability of sea otters for subsistence uses. SAE and USFWS recognize the importance of ensuring that Alaska Native Organizations and federally recognized tribes are informed, engaged, and involved during the permitting process and will continue to work with the ANOs and tribes to discuss their operations and activities. SAE has reached out and coordinated with numerous local communities including the cities and villages of Kenai and Ninilchik, as well as the Kenai Peninsula Borough, Cook Inlet Region, Inc., Cook Inlet Keepers, and the United Cook Inlet Drift Association.

USFWS anticipates that any effects from SAE's proposed seismic survey on sea otters would be short-term, site specific, and limited to inconsequential changes in behavior and mild stress responses. USFWS does not anticipate that the authorized taking of sea otters would reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by: (1) Causing the sea otters to abandon or avoid hunting areas; (2) directly displacing subsistence users; or (3) placing physical barriers between the sea otters and the subsistence hunters; and that cannot be sufficiently mitigated by other measures to increase the availability of sea otters to allow subsistence needs to be met.

4.2. Effects of Alternative 2 – No Action Alternative

Under the No Action Alternative, we would not issue an Authorization to SAE. As a result, SAE would not receive an exemption from the MMPA prohibitions against the take of sea otters and would, if they proceeded with their activities, be in violation of the MMPA if take of sea otters occurs.

The impacts to elements of the human environment resulting from the No Action alternative—conducting the 3D seismic survey program in the absence of required protective measures for sea otters under the MMPA—would be greater than those impacts resulting from Alternative 1, the Preferred Alternative.

4.2.1. Impacts to sea otter Habitat

Under the No Action Alternative, the survey would have no additive effects on the physical environment beyond those resulting from SAE's activities, which we evaluated in the referenced

documents. This Alternative would result in similar effects on the physical environment as Alternative 1.

4.2.2. Impacts to Sea Otters

Under the No Action Alternative, SAE's activities would likely result in increased amounts of Level B harassment to sea otters and possibly takes by injury (Level A harassment), serious injury, or mortality—specifically related to acoustic stimuli—due to the absence of mitigation and monitoring measures required under the Authorization. While it is difficult to provide an exact number of takes that might occur under the No Action Alternative, the numbers would be expected to be larger than those presented in Table 3 above because SAE would not be restricted in the total area that could be surveyed and would not be required to abide by seasonal restrictions to reduce the number of takes.

If the activities proceeded without the protective measures and reporting requirements required by a final Authorization under the MMPA, the direct, indirect, or cumulative effects on the human or natural environment of not issuing the Authorization would include the following:

- Sea otters within the survey area could experience injury (Level A harassment) and potentially serious injury or mortality. The lack of mitigation measures required in the Authorization could lead to vessels not altering course around sea otters, and not ramping up or powering or shutting down airguns when sea otters are within applicable injury harassment zones;
- Increases in the number of behavioral responses and frequency of changes in animal distribution because of the lack of mitigation measures required in the Authorization. Thus, the incidental take of sea otters would likely occur at higher levels than we have already identified and evaluated in our *Federal Register* notice on the proposed Authorization; and
- We would not be able to obtain the monitoring and reporting data needed to assess the anticipated impact of the activity upon the species or stock; and increased knowledge of the species as required under the MMPA.

4.2.3. Impacts to Subsistence

Under the No Action Alternative, the survey would have no additive effects on subsistence beyond those resulting from SAE's activities, which we evaluated in the referenced documents. The only potential difference in impacts is that SAE would not be required to ensure availability of sea otters for subsistence uses and would not be required to implement mitigation measures to that effect.

4.3. Compliance with Necessary Laws – Necessary Federal Permits

We have determined that the issuance of an Authorization is consistent with the applicable requirements of the MMPA, ESA, and our regulations. Please refer to Section 1.4 of this SAE EA for more information.

4.4. Unavoidable Adverse Impacts

SAE's application, our notice of a proposed Authorization, and other environmental analyses identified previously summarize unavoidable adverse impacts to sea otters or the populations to which they belong or on their habitats, as well as subsistence uses of sea otters, occurring in the seismic survey area. We incorporate those documents by reference.

We acknowledge that the incidental take authorized would potentially result in unavoidable adverse impacts. However, we do not expect SAE's activities to have adverse consequences on the viability of sea otters in Cook Inlet or on the availability of sea otters for subsistence uses, and we do not expect the sea otter populations in that area to experience reductions in reproduction, numbers, or distribution that might appreciably reduce their likelihood of surviving and recovering in the wild. We expect that the numbers of individuals of sea otters taken by harassment would be small (relative to species or stock abundance), that the seismic survey and the take resulting from the seismic survey activities would have a negligible impact on sea otters, and that there would not be an unmitigable adverse impact to subsistence uses of sea otters in Cook Inlet.

4.5. Cumulative Effects

NEPA defines cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR §1508.7). Cumulative impacts can result from individually minor but collectively significant actions that take place over a period of time.

The Cook Inlet region is a major population center in the State of Alaska and supports a wide range of activities. The proposed seismic survey would add another, albeit temporary, industrial activity to upper Cook Inlet. This activity would be limited to a small area of the upper Inlet for a relatively short period of time, and there would be no objects or materials permanently released into the water column. This section provides a brief summary of the human-related activities affecting sea otters in the action area.

4.5.1. Subsistence Hunting

As mentioned previously, very few sea otters (~1/year) are harvested by Kenai and Ninilchik subsistence hunters, the two villages adjacent to the action area. SAE's proposed seismic surveys will not make what few otters annually occur near these villages unavailable for subsistence harvest.

4.5.2. Pollution

As the population in urban areas continue to grow, an increase in amount of pollutants that enter Cook Inlet is likely to occur. Sources of pollutants in urban areas include runoff from streets and discharge from wastewater treatment facilities. Gas, oil, and coastal zone development projects

(e.g., the Chuitna Coal Mine) also contribute to pollutants that enter Cook Inlet through discharge. Gas, oil, and coastal zone development will continue to take place in Cook Inlet; therefore, it would be expected that pollutants could increase in Cook Inlet. However, the EPA and the ADEC will continue to regulate the amount of pollutants that enter Cook Inlet from point and non-point sources through NPDES permits. As a result, permittees will be required to renew their permits, verify they meet permit standards and potentially upgrade facilities. Additionally, the extreme tides and strong currents in Cook Inlet may contribute in reducing the amount of pollutants found in the Inlet.

4.5.3. Fisheries Interaction

Fishing is a major industry in Alaska. As long as fish stocks are sustainable, subsistence, personal use, recreational, and commercial fishing will continue to take place in Cook Inlet. As a result there will be continued prey competition, risk of ship strikes, potential harassment, and potential for entanglement in fishing gear. NMFS, USFWS, and the ADF&G will continue to manage fish stocks and monitor and regulate fishing in Cook Inlet to maintain sustainable stocks.

4.5.4. Gas and Oil Development

Currently, there are several gas and oil development projects in the proposed action area, and it is likely that future gas and oil development will continue to take place in the action area. SAE, for example, will be conducting seismic surveys in Cook Inlet for the next three to five years, and NMFS has received Authorization applications from other oil and gas companies requesting takes of sea otters incidental to seismic surveys and drilling operations, including another request to conduct seismic surveys very similar to that proposed by SAE with some spatial overlap. Impacts from gas and oil development include increased noise from seismic activity, vessel and air traffic and well drilling; discharge of wastewater; habitat loss from the construction of oil and gas facilities; and contaminated food sources and/or injury from a natural gas blowout or oil spill. The risk of these impacts may increase as oil and gas development increases; however, new development will undergo consultation and permitting requirements prior to exploration and development. If Authorizations are issued to these other applicants, they would be required to implement mitigation and monitoring measures to reduce impacts to sea otters and their habitat in the area and would be subject to the same MMPA and ESA standards.

4.5.5. Coastal Zone Development

Coastal zone development may result in the loss of habitat, increased vessel traffic, increased pollutants, and increased noise associated with construction and noise associated with the activities of the projects after construction. The Port of Anchorage (POA) is currently expanding their facilities and Port MacKenzie is scheduled to expand their facilities. Both port facilities may have a very slight effect on sea otters in the action area due to increased vessel traffic passing through the area on their way to both facilities, although sea otters are rarely found in shipping channels.

Port of Anchorage and Port MacKenzie Expansions

The POA and Port MacKenzie in upper Cook Inlet are either currently expanding or scheduled to expand their facilities. These ports will contribute to increased vessel traffic throughout Cook Inlet. The POA is expanding its facilities to accommodate increased growth in Alaska and to support military services at JBER. In the next five years at Port MacKenzie a fuel tank farm, the Rail Extension, and a deep draft dock are scheduled for construction. The Rail Extension would connect Port MacKenzie to the Alaska Railroad Corporation's existing mainline between Wasilla and Willow, providing freight service between Port MacKenzie and Interior Alaska. Port MacKenzie will be exporting coal from Healy, Alaska with the construction of the Rail Extension. The Rail Extension should be completed in 2014. Additionally, Port MacKenzie is currently preparing permits to construct a deep draft dock. As a result, number of ships calling to port at Port MacKenzie is expected to increase over the next five years. Increased vessel traffic may result in increased in water noise and potential ship strikes with sea otters, although otters are rarely found in the deeper water shipping channels.

4.5.6. Sea Otter Research

Because many important aspects of sea otter biology remain unknown, or are incompletely studied, and because management of this species requires knowledge of their distribution, abundance, migration, population, ecology, physiology, genetics, behavior, and health, free-ranging sea otters species are frequently targeted for scientific research and studies. Research activities normally include close approach by vessel and aircraft for line-transect surveys; behavioral observation; attachment of scientific instruments (tagging); live capture for health assessments. USFWS anticipates that scientific research on sea otters in Cook Inlet will continue, and possibly expand, due to the increasing need to better understand distribution and abundance relative to temporal and spatial parameters.

4.5.7. Climate Change

The 2007 Intergovernmental Panel on Climate Change concluded that there is very strong evidence for global warming and associated weather changes and that humans have "very likely" contributed to the problem through burning fossil fuels and adding other "greenhouse gases" to the atmosphere (IPCC, 2007). This study involved numerous models to predict changes in temperature, sea level, ice pack dynamics, and other parameters under a variety of future conditions, including different scenarios for how human populations respond to the implications of the study.

Evidence of climate change in the past few decades, commonly referred to as global warming, has accumulated from a variety of geophysical, biological, oceanographic, and atmospheric sources. The scientific evidence indicates that average air, land, and sea temperatures are increasing at an accelerating rate. Although climate changes have been documented over large areas of the world, the changes are not uniform and affect different areas in different ways and intensities. Arctic regions have experienced some of the largest changes, with major

implications for the marine environment as well as for coastal communities. Recent assessments of climate change, conducted by international teams of scientists (Gitay et al., 2002 for the Intergovernmental Panel on Climate Change; (IPCC) Arctic Climate Impact Assessment, 2004; IPCC, 2007), have reached several conclusions of consequence for this EA:

- Average arctic temperatures increased at almost twice the global average rate in the last 100 years.
- Satellite data since 1978 show that perennial arctic sea ice extent has shrunk by 2.7 percent per decade, with larger decreases in sea ice extent in summer of 7.4 percent per decade.
- Arctic sea ice thickness has declined by about 40 percent during the late summer and early autumn in the last three decades of the 20th century.

Marine mammals are classified as sentinel species because they are good indicators of environmental change. Arctic marine mammals are ideal indicator species for climate change, due to their circumpolar distribution and close association with ice formation. USFWS recognizes that warming of the Arctic, which results in the diminishing of ice, could be a cause for concern to marine mammals. In Cook Inlet, marine mammal distribution is also dependent upon ice formation and prey availability, although a loss of sea ice might benefit sea otters given sea ice limits otter distribution wherever it prevents otters from foraging.

It is not clear how governments and individuals will respond or how much of these future efforts will reduce greenhouse gas emissions. Although the intensity of climate changes will depend on how quickly and deeply humanity responds, the models predict that the climate changes observed in the past 30 years will continue at the same or increasing rates for at least 20 years. Although USFWS recognizes that climate change is a concern for the sustainability of the entire ecosystem in Cook Inlet, it is unclear at this time the full extent to which climate change will affect sea otters.

4.5.8. Conclusion

Based on the summation of activity in the area provided in this section, USFWS believes that the incremental impact of an Authorization for the proposed SAE seismic survey in Cook Inlet would not be expected to result in a cumulative significant impact to the human environment from past, present, and future activities. The potential impacts to sea otters, their habitats, and the human environment in general are expected to be minimal based on the limited and temporary noise footprint and mitigation and monitoring requirements of the Authorization.

Chapter 5 List of Preparers and Agencies Consulted

Agencies and groups Consulted
Add other people and organizations.

Prepared By
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